

Having described the invention, the following is claimed:

1. A particle accelerating apparatus for accelerating charged particles, comprising:
 - at least two pair of accelerating elements, each accelerating element including a first electrode plate and a second electrode plate, wherein said first and second electrode plates are spaced apart by a gap;
 - first and second magnets for producing a magnetic field B, wherein said plurality of accelerating elements are located between said first and second magnets; and
 - a voltage generator for applying a voltage V across each of said first and second electrode plates.
2. A particle accelerating apparatus according to claim 1, wherein said apparatus further comprises particle injection means for providing a source of said charged particles.
3. A particle accelerating apparatus according to claim 1, wherein said apparatus further comprises:
 - a housing defining a chamber wherein said plurality of accelerating elements are located, said housing including an output port for said charged particles to exit said housing.
4. A particle accelerating apparatus according to claim 1, wherein said apparatus further comprises a deflecting magnet for modifying a trajectory of said charged particles.
5. A particle accelerating apparatus according to claim 1, wherein said apparatus further comprises means for reducing the pressure inside said chamber.
6. A particle accelerating apparatus according to claim 1, wherein each of said first and second electrode plate includes a slot formed therein.

7. A particle accelerating apparatus according to claim 1, wherein said voltage V is in the range of 10 kV to 100 kV.

8. A particle accelerating apparatus according to claim 1, wherein said magnetic field B is in the range of 0.05 T to 50 T.

9. A circular accelerator for accelerating the velocity of a charged particle, comprising:

at least two accelerating gaps;

means for producing an electric field in said accelerating gaps, wherein said charged particle is accelerated by said electric field; and

means for producing a magnetic field, wherein a travel path of said charged particle is influenced by said magnetic field.

10. A circular accelerator according to claim 9, wherein each said accelerating gap is located between a first electrode plate and a second electrode plate.

11. A circular accelerator according to claim 10, wherein said first and second electrode plates include a slot formed therein.

12. A circular accelerator according to claim 9, wherein said means for producing the electric field includes a voltage generator.

13. A circular accelerator according to claim 9, wherein said means for producing the magnetic field includes a first and a second magnet.

14. A method for accelerating a charged particle, comprising:

applying a voltage across at least two pair of electrode plates defining an accelerating gap, said voltage producing an associated electric field; and

injecting a charged particle into said accelerating gap of one of said two pair of electrode plates; wherein said charged particle travels in a generally circular orbit through said accelerating gaps.

15. A method for accelerating a charged particle according to claim 14, wherein said method further comprises:

deflecting said charged particle by a magnetic field, wherein said charged particle is diverted from said generally circular orbit.